



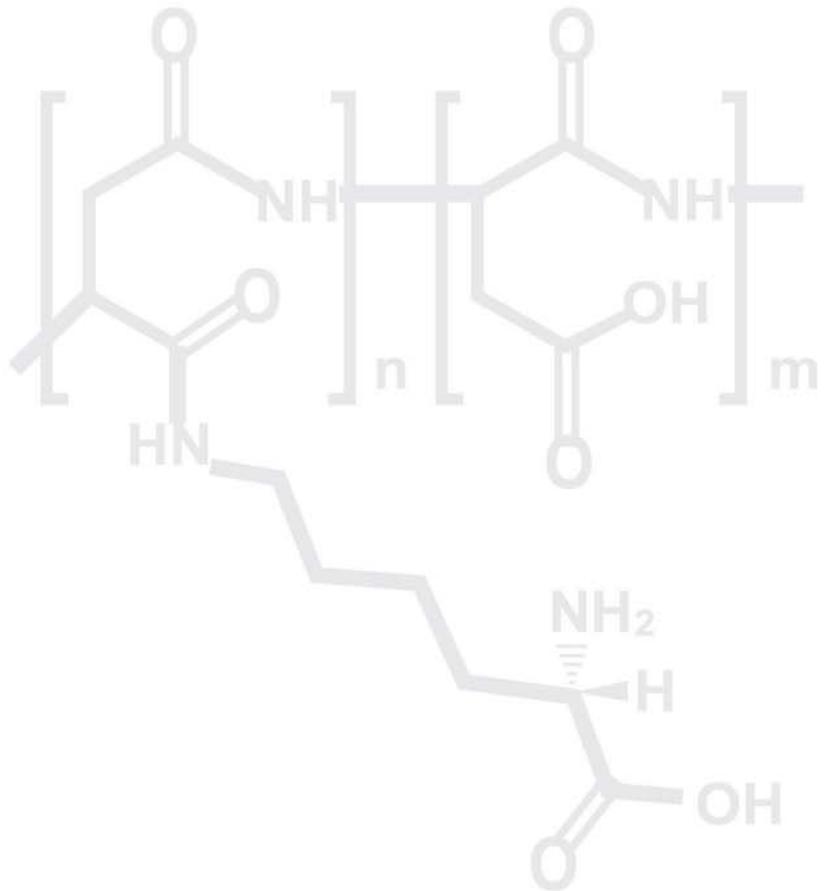
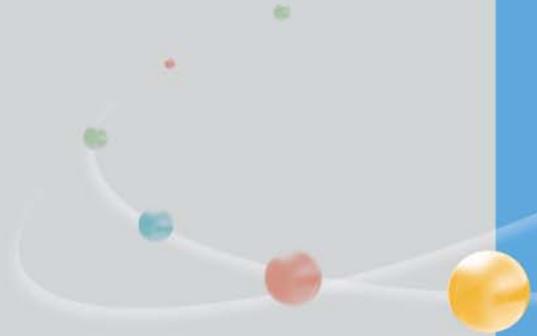
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# H&A

## PHARMACHEM

*Unique SOME Technology & Diverse raw-materials*





## H&A Pharmachem's SOME Technology and Raw-materials

### NANO CAPSULE

- \*LIPOSOME
- \*NANO PARTICLE
- \*CUBOSOME
- \*MLV
- \*NSV(Nonionic Surfactant Vesicle)
- \*NANO ~ SUBMICRON EMULSION
- \*AQUA SERIES
- \*SLN, NLC
- \*GPCSOME
- \*TRANSFERSOME

### NANO HYBRID

- \*SOL-GEL HYBRID
- \*BIO-INORGANIC HYBRID
- \*INORGANIC-INORGANIC HYBRID
- \*BIOPOLYMER-ORGANIC HYBRID
- \*BIOPOLYMER-INORGANIC HYBRID

### MICRO CAPSULE

- \*HIGH POLYMER CAPTURE
- \*LIPOSOME COATING
- \*GELLATIN COATING
- \*BIO-ENCAPSULATION  
(Co-Extrusion / Double Capsule)

### RAW-MATERIALS

- \*CETAMIDO LYSINAMIDO  
POLYASPARTIC ACID
- \*PHYTOCARE
- \*R-BASE
- \*G-BASE
- \*VERTISPHERE RETINOL
- \*NANOCERAMIDE
- \*PGA-BG

## H&A Pharmachem

- Unique SOME Technology & Liposome Technology
- Aqua Seriese
- Nanoceramide
- Phytocare
- Cetamido Lysinamido Polyaspartic Acid
- Vertisphere
- Bio-Encapsulation product(R-BASE / G-BASE)
- SLM, NLC
- GPCSOME

## Brief Company

Technology based Performance for Liposome & Nano Emulsion!

Since H&A Pharmachem has been founded in 2002, we are focusing on Cosmetics, Foods and Veterinary sectors by developing Liposome and Nano-emulsion ingredients.

We are trying to give solutions to our customers and partners with our Liposome and Nano-emulsion technologies.

By harmonizing Human, Agriculture, Pharmaceuticals, Food and Chemicals, H&A Pharmachem wants to be a leader for the prosperity and happiness of mankind. With the highest value of the respect for human, we can contribute for the future promising prosperity by accomplishing the coexistence of every products of ours with the Mother Nature.

Above all, we will do our best for the research and development with H&A Pharmachem Nano-technology to enrich your lives.

## APPLICATION AREA

- Developing functional materials for cosmetics and foodstuff
- Developing medicine and medical supplies and animal pharmaceuticals
- Drug delivery enhancing system
- Environmental - agriculture related industry



## Aqua series

### ● ● ● Advantage for AQUA Series Products

- Stabilization of unstable compound or poorly soluble substance
- Used natural originated raw materials
- No preservatives
- Develop clear or hazy emulsion
- Ready to use without additives
- Develop dispersible wax and oil

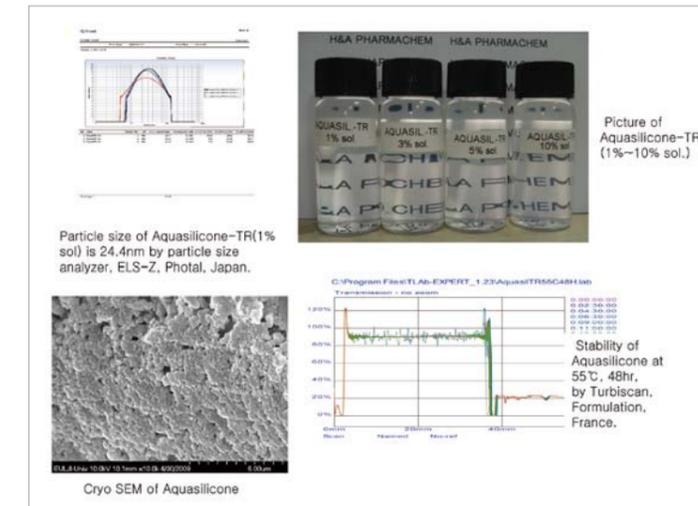
PRODUCT NAME	MAIN COMPOSITION	APPLICATION
AQUA SILICONE	Dimethicone 6CS (20%)	Skincare - Broader application for cosmetics - Superior efficiency - Mechanically, thermally, pH stable - Ready to use for production - Chemically unmodified substances
AQUA SILICONE - TR	Dimethicone 6CS (20%)	Skincare - More clear than Aqua Silicone
AQUA CoQ10 (PCT Product)	Co Enzyme Q-10 (1%, 10%, 20%)	Skincare / Food - Water soluble, Edible - Antioxidation effect - Mechanically, thermally, pH stable - Processing without additives - Ready to use for production

## Aqua Silicone-TR

### ● ● ● AQUA SILICONE - TR

NANO EMULSION for personal care products

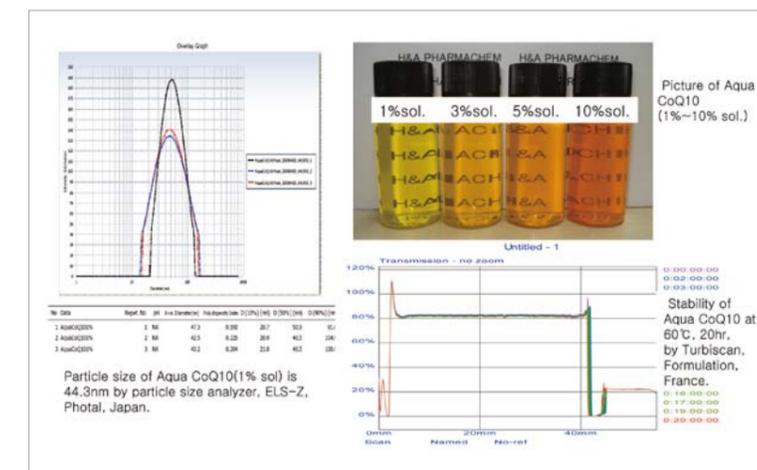
Aquasilicone-TR has excellent skin feel & stability in the formula, water soluble clearly.



### ● ● ● AQUA CoQ10

NANO EMULSION for personal care and food products

Aqua CoQ10 has excellent skin feel & stability in the formula, water soluble clearly.





## Other Aqua Serise

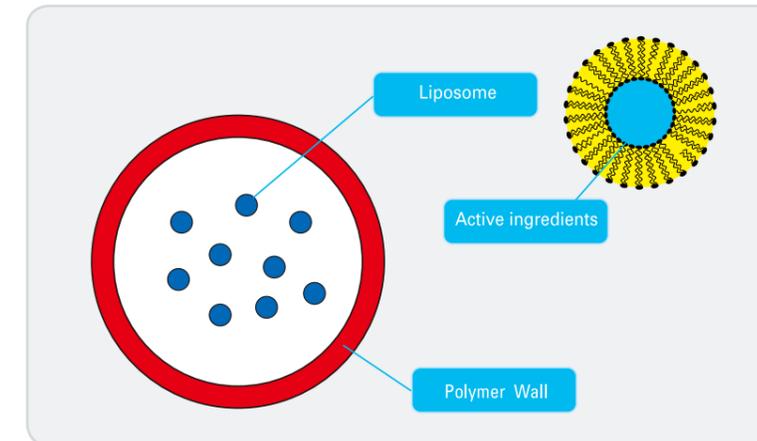
### Other Aqua Serise

PRODUCT NAME	MAIN COMPOSITION	APPLICATION
AQUA WAX	Cetyl palmitate or Bees wax or Smart wax or Rice wax	Skincare / Suncare - Stable liquid wax - Superior skin feel - Exellent emollient effect - Possibility for active capture
AQUA CLA (PCT Pending)	Conjugated Linoleic Acid(15%,45%)	Skincare / Food - Water soluble, Edible - Skin barreir function - Unsaturated fatty acid for skin
AQUA OMEGA-3	Omega 3 oil(12%,21%)	Skincare / Food - Water soluble, Edible - Skin barreir function - Unsaturated fatty acid for skin
AQUA SUNMIST	OMC, Octocrylene, BEMT	Suncare - High contents for sprayable product - Ready to use for production - Mechanically, thermally, pH stable
AQUA OMC 50	OMC(45-50%)	Suncare - Water dispersible - Sprayable product(Sunspray etc.) - Ready to use for production
AQUA SHEABUTTER	Sheabutter	Skincare - Natural origined - Exellent emollient effect
AQUA ASTAXANTHIN	Astaxanthin 100ppm ~ 0.5%	Skincare - Water dispersible - Antioxidation effect - Mechanically, thermally, pH stable - Ready to use for production
SKIN LIPID 334	Ceramide 3B, Oleic acid, Lecithin, Cholesterol	Skincare - Similar composition of human skin SC - Excellent emollient effect

## BIO-Encapsulation

### R-Base

Enclosing small particle(solid or liquid) within a layer of coating(or a shell)  
For time-release & smart-release



Schematic diagram of R-Base



Picture of R-Base

### G-Base

- Cream base and essence for silky feel
- Non-sticky
- Silicon and silicon polymer
- Pickering emulsion
- Recommended dosage - 5 ~ 20% for Si/W & O/W emulsion
- Composition: Dimethicone/Vinyl dimethicone Crosspolymer(and)Cyclomethicone(and) water(and)Glycerine(and)Butylene glycol

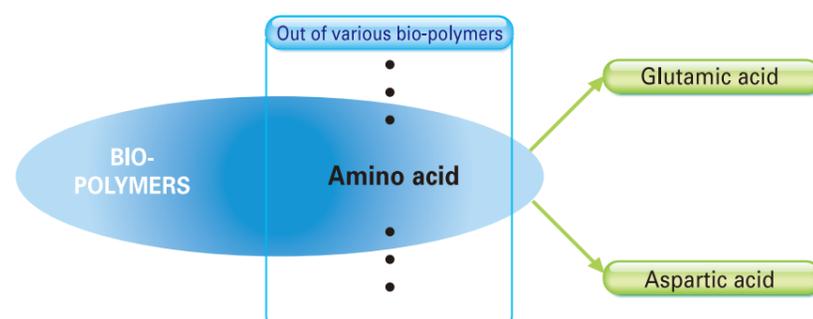


## PLA

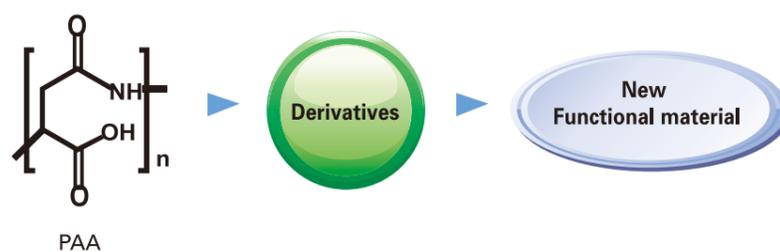
**CETAMIDO LYSINAMIDO POLYASPARTIC ACID** : Assigned INCI Name  
New Generation for cosmetic active material

### ● ● ● PLA

- Bio-polymer based active material
- Excellent skin affinity & safety
- Collagen production effect & Anti-allergy effect
- Bio-encapsulation for delivery system



- Schematic diagram of PLA



- Diagram for synthesis

## PHYTOCARE

**PHYTOCARE** : Natural emulsifier composed of hydrogenated lecithin and vegetable lipids.  
Developed for lamellar liquid crystal formula.

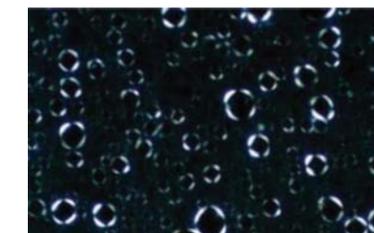
### ● ● ● The Reasons for using Lecithin

- The peculiar feeling of lecithin on the skin
- Skin familiarity
  - Many materials make up the human skin cell wall.
  - One of them is the lecithin, a very important intercellular lipid.
- The formation of the lamella structure
  - The human skin is composed of lamella of lecithin system.
  - When using lecithin, ceramide and cholesterol altogether, lamella is easily formed and artificial skins are formed on the outer walls of the real skin.
- Increased moisturizing effect
  - Compared to normal O/W and W/O systems, lamella structure has a high capacity of moisture keeping, owing to its peculiar structure.
- Improved skin penetration effects
  - Because of the skin familiarity, cosmetic ingredients can penetrate skin more deeply.

### ● ● ● Liquid Crystal of LLCE

By using light a microscope (OLYMPUS BX50), Optical Anisotropic of Maltese cross, typical multi-layers of emulsion, was confirmed.

And, the structures of those association are considered to be similar to the lamella structure of the horny layer. (LLCE=Lamellar Liquid Crystal Emulsion)

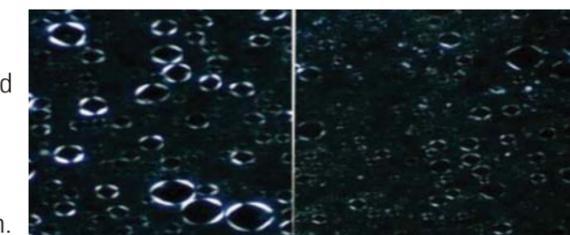


Optical microscopy photograph of LLCE (x 100, polarized light)

### ● ● ● The Stability of LLCE

The stability was observed by store LLCE into a cycling incubator (-20 ~ 45 °C) for 6 weeks. As shown in this figure, the liquid crystal structure of the sample had not changed after 6 weeks, when compared to the before-incubator status.

So, the stability of LLCE emulsion is shown. (LLCE=Lamellar Liquid Crystal Emulsion)



(a) After a day

(b) After 6 weeks



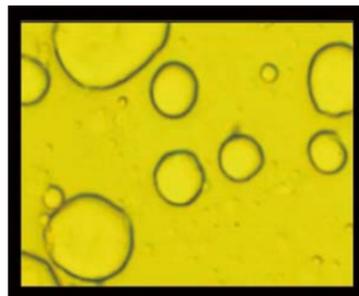
# Nanoceramide

## ● ● ● NANOCERAMIDE

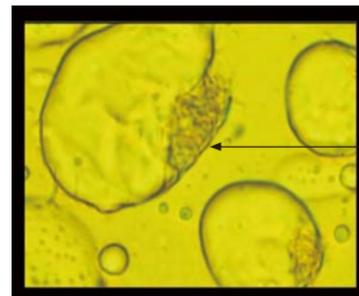
- Prevent re-crystallization of ceramide.
- Effective moisturizing for atopy.
- Skin barrier function
- Easy to use especially for O/W system

## ● ● ● Cycling test for stability

- 5 times cycling (-4°C ~ 40°C )
- 6 hours / each temperature

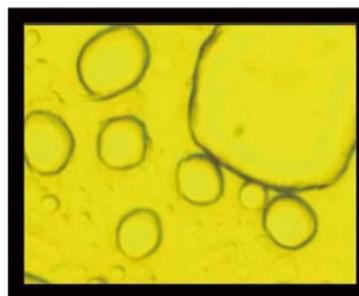


Dispersed Ceramide / Initial

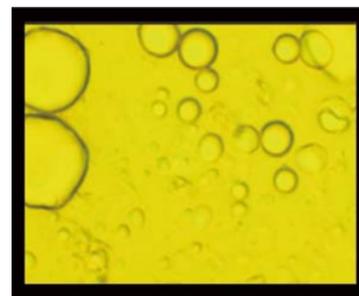


Dispersed Ceramide / 5 cycles

Recrystallized Ceramide



Nano Ceramide / Initial

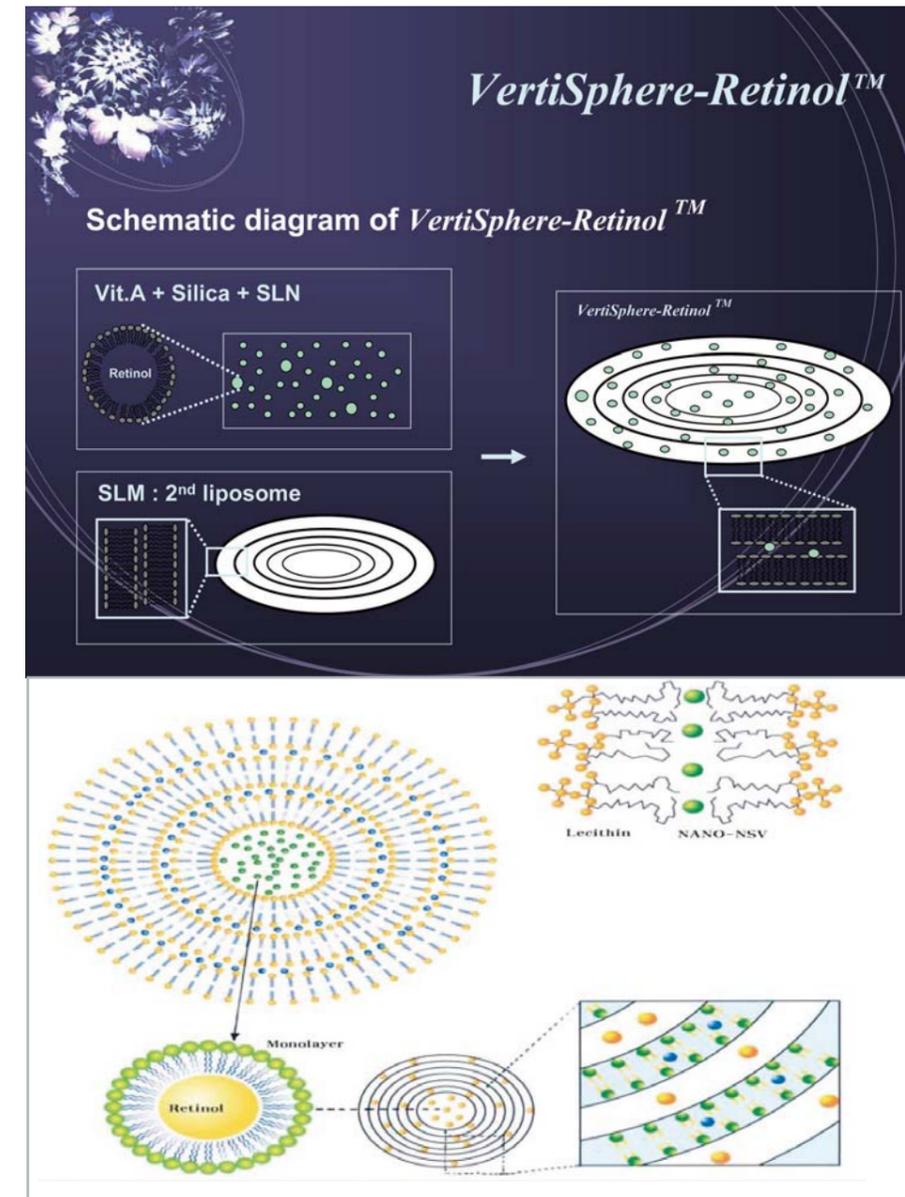


Nano Ceramide / 5 cycles

# Vertisphere-Retinol

## ● ● ● VERTISPHERE-RETINOL

- Triple stabilized retinol.(Retinol 150,000iu)
- Mechanically, thermally, pH stable

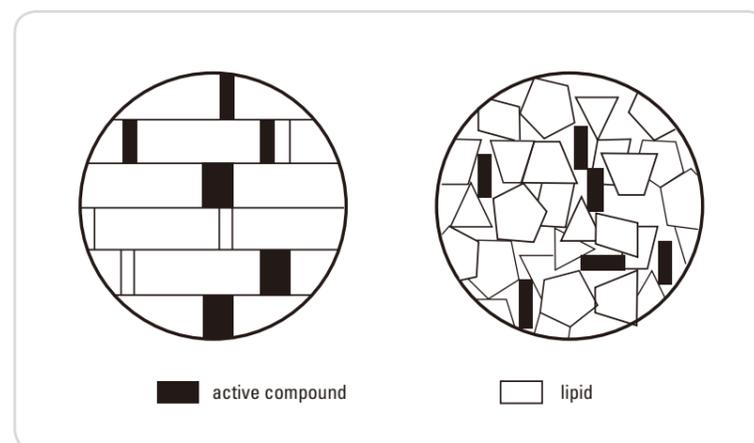




## SLN/NLC & OTHERS

### ● ● ● SLN/NLC

- Solid Lipid Nanoparticles(SLN) / Nanostructured Lipid Carriers(NLC)
- Stabilized active materials with solid matrix captured
- Protected from outer surroundings
- Improve solubility for non-soluble actives
- Time-release for drug delivery



- Schematic diagram of SLN(left) and NLC(right)

### ● ● ● Other Products

PRODUCT NAME	MAIN COMPOSITION	APPLICATION
GPCSOME	Glycerophosphocholine	Skincare - Enhance skin penetration possibility - Excellent skin affinity - Good stability - High yield for liposome
TRANSFERSOME	Lysolecithin	Skincare - Enhance skin penetration possibility - Excellent skin affinity - Soft bilayer membrane
NSV Base	Nonionic Surfactant Vesicle	Skincare - Nonionic surfactant vesicle for nanoemulsion, multi lamella, liquid crystal - High emolliency product
PGA-BG	Poly Glutamic Acid	Skincare, Hair care - Amino acid biopolymer from fermented soybean - Excellent moisturizing effect
NANO-VE	Vitamin E Acetate(20%)	Skincare - Powerful antioxidant effect

## Patents

### ● ● ● Patents

- Aqueous Nano-emulsion composition containing Conjugated Linoleic Acid.
- Oral care composition comprising nano-particulated Cinnamon Extract.
- Nano-emulsion containing lecithin and polyglycerine fatty acid ester and moisturizer composition comprising thereof.
- Nano-emulsion composition of Co-enzyme Q10.
- Pharmaceutical composition for animal drug.
- Nano composition for solubilization comprising amphoteric surfactant and polyol.
- Composition for nano carrier comprising extract of Licorice, Tocopherol and Balsam, oral care product using it.
- Nanosphere comprising EGF, Hardy-orange extracts and tocopherol and an oral hygiene composition containing the nano sphere.
- Composition of nanosphere comprising propolis and tocopherol.
- Nano shell composition comprising copper peptide, xylitol and tocopherol and an oral hygiene.
- Nano liposome composition and cosmetic comprising nano liposome produced therefrom.
- Nanoemulsion containing wild ginseng extract and personal care composition comprising the same.
- Liposome preparation using lysolecithin and glycerophosphocholine, and personal care composition comprising the same.
- Silicone gel composition and method for preparing globular particle therefrom.
- Nanoemulsion containing polyaspartic acid derivative and personal care composition comprising the same.

### ● ● ● Joint project with the Korean Government

- Technological Innovation Project : The Small and Midium Business Administration (2004~2005)  
- Development of clear nanoemulsion with phospholipid and polyols.
- Technological Innovation Project : The Small and Midium Business Administration (2006~2007)  
- Development of stable carotenoids system with Nanostructured Lipid Vesicle(NLV).
- Technological Innovation Project : The Small and Midium Business Administration (2007~2009)  
- Development of nano-liposome with deep seawater.



## RESEARCH PERFORMANCE

### ● ● ● ABSTRACT

#### IFSCC, Mexico. 1997

Study on stability, efficacy, and effect of a cream containing 5% of retinyl palmitate.

#### ASCS, Indonesia. 1999. Apr.

A study on stability, efficacy, and effect of colloidal silver emulsion.

#### COSMETICS & TOILETRIES. 1999. Mar.

Retinyl palmitate at 5% in a cream : It's stability, efficacy and effect.

#### PCIA, Bangkok. 2001. Mar.

New Millennium Formulation- Doublesphere.

#### PCIA, Korea. 2001. Mar. / IN-COSMETICS, Germany. 2001. Apr. / IFSCC, Taiwan. 2001.

Synthesis of transparent solution with high concentrated NANO Titanium dioxide.

#### IFSCC, Sweden. 2001. May.

Dualliposome.

#### IFSCC, London. 2002. Sep.

1. Study on the method of manufacture, efficacy, and effect of cubosome using retinol and ursolic acid.
2. Study on the lamellar liquid emulsion(LLCE) using lecithin and fatty alcohol.

#### IFSCC, Seoul. 2003. Sep.

1. Study for Organic(Bio)-Inorganic Nano-Hybrid OMC.
2. Study of complete transparent nano-emulsions which contain oils.
3. The study on stabilization of Retinol-Nanoemulsion using Skin Lipid Matrix(SLM).
4. Study on nanoemulsion using various lecithins and oils.

#### Society of Cosmetic Chemists. 2004. May.

The study for retinol stability using 3-dimension.

#### IFSCC. 2004. Oct.

1. The study for stability of useful Glycyrrhiza Uralensis(Licorice Root) using Nanosolve and PMMA.
2. Lamellar-bio nano-hybrid : the study for stability of catechin (green tea: EGCG) using 3-dimensional liposome.
3. Inorganic-Organic Nano-Hybrid : Preparation of nano-sized TiO<sub>2</sub> paste trapped OMC Nano-Emulsion and its application for cosmetics.

#### COSMETICS & TOILETRIES. 2004. Dec.

The study for retinol stability using Triply Stabilized(TS) System.

#### IFSCC. 2005. Oct.

1. The study for Nanoceramide with diverse size.
2. The study for retinol stability using PGA.

#### IFSCC. 2006. Oct.

1. The Study for Nanoceramide with 80nm size.
2. The Study for astaxanthin stability using three vector system.
3. The applied liposome system of phytosphingosine ascorbate and its skin effects.

#### IFSCC. 2007. Sep.

1. Research for O/W/O multiple emulsion use of nanoemulsion.
2. Preparation of Nano platinum liposome and its application in cosmetics.
3. Study for stability of useful Aloesin and Licorice Root (AL) using NanoSolve and porous silica.
4. The Study for astaxanthin stability using Nanostructured Lipid Vesicle(NLV).
5. Study on the bio-mimic liquid crystal emulsion (BLCE) for skin barrier.
6. Nano-Hybrid ; The study for stability of GLA(Gamma Linolenic Acid) using 3-dimensional liposome.
7. The study of transparent nano-emulsions system.

#### IFSCC. 2008. Oct.

1. Study on the stabilization of retinol using the various liposome systems.
2. Study for multiple emulsion(O/W/SI) use of NANOSOLVE.
3. The study for CoQ10 Stability using Nanostructured Lipid Vesicle(NLV).
4. Study for stability of useful Sophora flavescens(SF) using NanoSolve and porous silica.
5. Preparation of Nano-ZnO-Paste with being encapsulated the nanoemulsion OMC and its application in cosmetics.

#### IFSCC. 2009. Oct.

1. Study on the stabilization of Sophora Angustifolic(SA) using the various liposome system.
2. Study for SI/W/SI use of ALOE POWDER.
3. The study for Lutein Stability using Nanostructured Lipid Vesicle(NLV).

#### IFSCC. 2010. Sep.

1. NEW GREEN ANTI-AGING MATERIAL : Properties and activities of the synthesized poly (aspartic acid) derivatives using L-lysine.
2. The study for Curcumin stability using Nanostructured Lipid Vesicle(NLV).

#### IFSCC. 2011. Oct.

1. The study for retinol stability using NLC and SLM.
2. The study for poly(aspartic acid)-lysine stability using Nanostructured Lipid Vesicle(NLV).

